

R E M A R K S

Claims 1-13 and 15-28 are pending in this application and stand ready for further action on the merits. Claims 1, 5-13 and 15-27 have been withdrawn from consideration as being drawn to nonelected subject matter. Claim 2 has been amended to more clearly recite the process steps. Support for new claim 28 can be found in claim 1 and in the specification at page 16, lines 24-26.

No new matter has been added by way of the above amendments.

Interview

Applicants note with appreciation that the Examiner has conducted an interview with Applicants' representative on June 8, 2004. The Examiner was very helpful in clarifying the outstanding issues.

The following sections correspond to the sections of the outstanding Office Action.

**Section B**

The Examiner has formally made of record the restriction requirement set forth in the June 8, 2004 interview. The Examiner has restricted the claims into the following groups:

- I. Claims 1, 5-13 and 15-27, drawn to a powder mixture, classified in class 252, at least subclass 502 and the record.
- II. Claims 2-4, drawn to rotational process, classified in class 541, at least subclasses 328 and 330.

Applicants respectfully submit that new claim 28 should be considered to be part of Group II, since claim 28 is a process claim.

Applicants affirm the election of Group II, consisting of claims 2-4 and 28, with traverse.

According to MPEP §803, if the search and examination of an entire application can be made without a serious burden, the Examiner *must* examine it on the merits, even though it includes claims to independent or distinct inventions. As evidence of the undue burden, the Examiner has listed that class 252, (at least) subclass 502 is to be searched for Group I. In view of:

- i) the likelihood that a significant portion of the patents belonging in the subclasses which must be searched for

Group II would also be classified in the subclasses which must be searched for Group I;

ii) the fact that the computer searching software used by the Examiner enables the Examiner to combine the search for patents in multiple subclasses without having to view duplicates; and

iii) the product claims of Group I are in the product-by-process format so that the process must be searched irrespective of whether Group I or Group II is chosen,

the search of the extra subclass(es) would not amount to an undue burden on the Examiner to consider all of claims 1-13 and 15-28. As such, Applicants respectfully request that the Examiner rejoins Group I with elected Group II.

#### **Section D**

Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. (U.S. 6,517,974).

Applicants respectfully traverse the rejection.

Applicants note that the elected invention is drawn to a process, and as such, the Examiner must give patentable weight to distinctions between the inventive process and the process of Kobayashi et al. irrespective of whether there are distinctions

between the structure of the final product of the invention and the final product of Kobayashi et al.

(1) Fig. 5 of Kobayashi et al.

With respect to Figure 5, Kobayashi et al. teach:

"A main shaft 101, 204 are rotated (revolved) so that rings 104, 204 are rotated on their own axes." (See column 14, lines 36-38).

As shown in FIG. 5, only the main shaft and the rings rotate (revolve).

There is no teaching in Kobayashi et al. that the container 102, 202 both rotates and revolves, as presently claimed.

(2) As to the "Type of Apparatus" of Kobayashi et al.

Kobayashi et al. teach the following:

"A preferred apparatus for mechanical grinding is an apparatus as shown in FIGS. 4 and 5 which is capable of giving a large collision energy, e.g., centrifugal force, to the particles of materials. Specifically, the apparatus should be able to revolve or rotate the container in which the materials are placed, or revolve or rotate the medium in the container so that the material in the container is given rotational motion. Such apparatuses include a planetary ball mill, rolling ball mill, oscillating ball mill, various crushers, and high speed mixer, etc." (See column 15, lines 1-11). (Emphasis added).

Therefore, the cited patent fails to disclose the apparatus in which the container rotates and revolves, as presently claimed.

(3) As to the "EXAMPLES" of Kobayashi et al.

The following matter is described in Example 1 of Kobayashi et al.:

"50 wt % of lithium nickel oxide in the crystallized condition and 50 wt% of nickel were put into a vessel of a planetary ball mill (having a diameter of 4 cm) and subjected to mechanical grinding for one or two hours using stainless steel balls having a diameter of 15 mm with a driving motor set at a rotating frequency of 3700 rpm to apply 15G to the material." (See column 22, lines 47-53). (Emphasis added).

The following matter is described in Example 3 of Kobayashi et al.:

"After setting a planetary ball mill (vessel diameter 23 cm) at a revolving frequency of 200 rpm ... " (See column 24, lines 17-19). (Emphasis added).

All the other Examples also fail to disclose the apparatus in which the container both rotates and revolves, as presently claimed.

On the other hand, the inventive method is performed in the container which is rotated and revolved itself. The inventive method therefore is quite different from that of the cited patent.

(4) Rotating and Revolving Container:

The feature of the invention resides in a battery active material powder mixture for electrical double-layer capacitors prepared by placing a battery active material or a carbonaceous material for electrical double-layer capacitors and an electrically conductive powder in a mixing container, then **rotating and revolving** the container so as to effect dry mixture.

The powder mixtures prepared by the operation have an orderly mixed state, as shown in Figure 1, in which the conductive substance having an average particle size of 10 nm to 10  $\mu\text{m}$  adheres to the periphery of the battery active substance or the carbonaceous material for electrical double-layer capacitors.

The powder mixture having the orderly mixed state is obtained for the first time by rotating and revolving the container containing the battery active material or the carbonaceous material and the electrically conductive powder.

That is, when the conductive powder and the battery active material or the carbonaceous material are placed in the mixing container and dry mixture is carried out using a planetary mixer that subjects the mixing container to both rotation and revolution, triboelectrification between the particles being mixed causes the hitherto agglomerated conductive powder to disperse into primary particles, which then attach to the periphery of the battery active material or carbonaceous material for electrical double-layer capacitors having a large average particle size.

Moreover, in this case, the use of the conductive powder having an average particle size of 10 nm to 10  $\mu$ m in combination with the battery active material or the carbonaceous material having an average particle size, which is larger than that of the conductive powder (e.g., within a range of 1 to 100  $\mu$ m) causes the relative motion of the particles to change from a volume effect proportional to the cube of the particle size to a surface area effect proportional to the square of the particle size. This allows electrostatic forces to exert a larger influence, making it easier to create the orderly mixed state of the adhesive powder.

Kobayashi et al. fails to teach or suggest the formation of a dry mixture using a container that both rotates and revolves.

(5) Grinding:

A distinction between the inventive method of preparing a battery active material powder mixture and the method of Kobayashi et al., is that the method of Kobayashi et al. comprises the use of a planetary ball mill, which **grinds** the product using stainless steel balls having a diameter of 15 mm, whereas the inventive method simply involves dry mixing by rotation and revolving of the container. The inventive method does not include a step of grinding the mixture.

Accordingly, claim 2 has been amended to clarify that the inventive method does not involve grinding the mixture of the battery active material and the electrically conductive powder by using the transitional phrase "consisting of".

Furthermore, new claim 28 has been added which recites that the mixing container "consists essentially of" materials having an average particle diameter of 0.1 to 100  $\mu\text{m}$ . According to MPEP 2111.03, the transitional phrase "consisting essentially of" excludes any materials/steps which materially affect the process. Applicants respectfully submit that the large "particles" such as stainless steel balls would materially affect the process and as such are excluded from claim 28.

Based on the foregoing, significant patentable distinctions exist between the present invention and the teachings of



Kobayashi et al., and as such, withdrawal of the rejection is respectfully requested.

Conclusion

In view of the above amendments and comments, Applicants respectfully submit that the claims are in condition for allowance. In the event the Examiner finds to the contrary, the Examiner is respectfully requested to enter this Amendment into the official record to place the claims in better form for appeal.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact **Garth M. Dahlen, Ph.D., Esq.** (Reg. No. 43,575) at the telephone number of the undersigned below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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